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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,154	01/09/2004	Kevin J. Moeggenborg	100141	9641

29050 7590 11/16/2006

STEVEN WESEMAN  
ASSOCIATE GENERAL COUNSEL, I.P.  
CABOT MICROELECTRONICS CORPORATION  
870 NORTH COMMONS DRIVE  
AURORA, IL 60504

EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/755,154

Applicant(s)

MOEGGENBORG ET AL.

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 8/30/06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 14-22 is/are rejected.
- 7) ☒ Claim(s) 4-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

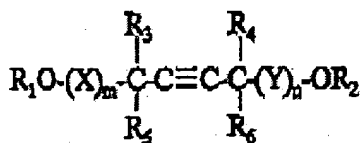
**DETAILED ACTION*****Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

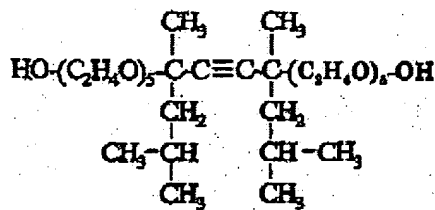
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 3, 14-20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (EP 1 279 708 A1).

As to claims 1-3, 14-20, and 22, Sakai teaches a polishing composition that comprises: at least one abrasive; at least one organic compound such as polyoxyalkylene addition polymer (same as Applicants' polymer) as seen in formula (1) below and formula (3), which is diisobutyldimethylbutynediol polyoxyethylene glycol ether, is an example of formula (1); hydrogen peroxide (same as Applicants' oxidizing additive) and water (same as Applicants' carrier). (Abstract and [0033, 0075, and 0082]). The polyoxyalkylene addition polymer is represented by formula (1), wherein each  $R_1$  to  $R_6$  is H or a  $C_{1-10}$  alkyl group and m and n is a positive number from 1 to 20 (Abstract). Formula (3) shows more branching in formula (3).



formula (1)



formula (3)

The above reads on,

A polishing system comprising:

(a) a liquid carrier,

(b) a polymer, and

(c) a polishing pad, an abrasive, or a combination thereof, **in claim 1;**

wherein the polymer is a polyglycerol ([0030-0032]), **in claim 14;**

wherein the polymer comprises surface functional groups selected from the group consisting of amines, amides, carboxylic acids, sulfonic acids, phosphonic acids, hydroxyl groups, salts thereof, and combinations thereof ([0030-0032]), **in claim 15;**

wherein the polymer has a molecular weight of about 1,000 to about 1,000,000 g/mol ([0033]), **in claim 16;**

wherein the molecular weight is about 2,000 to about 500,000 g/mol ([0033]), **in claim 17; and**

wherein the system comprises an abrasive suspended in the liquid carrier ([0051]), **in claim 20; and**

further comprising one or more polishing additives selected from the group consisting of chelating or complexing agents, oxidizing agents, surfactants, anti-foaming agents, biocides, and combinations thereof [0048], **in claim 22.**

However, Sakai differs in failing to explicitly disclose a polymer having a branching of about 50%, 60% and 70% or greater, **as recited respectively in claims 1-3;**

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wherein the polymer comprises a highly branched core comprising monomer, wherein about 50% or more of the monomers within the highly branched core are branched, **in claim 18**; and

a viscosity that is about 70% or less **in claim 19**.

Sakai illustrates in formula (3), an example of polymers having many branched structures, is known. Using formula (3) as an example, wherein  $R_1$  to  $R_6$  is  $C_{1-10}$  alkyl group and m and n is a positive number from 1 to 20, suggests a polymer backbone in which more branching is possible. Therefore, in the absence of unexpected result, the presently claimed polymer would obviously have been provided to one having ordinary skill in the art at the time the invention was made by selecting a polymer having a branching as taught by Sakai, including Applicants' specifically claimed degree of branching, for the purpose of suppressing recesses on copper wiring in polishing of a device (Sakai, [0040]).

3. Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai (EP '708 A1) as applied to claims 1-3, and 14-20 above, and further in view of Chou et al. (US-PGPUB 2002/0125461 A1).

Sakai differs in failing to disclose a polishing system wherein the system comprises an abrasive fixed to a polishing pad.

Chou teaches a polishing system can comprise a polishing pad wherein either an abrasive is suspended in the liquid portion of the polishing system or the abrasive can be fixed on a polishing pad ([0015-0017]).

Chou illustrates a polishing system wherein the system comprises an abrasive fixed to a polishing pad is known. Hence, it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to substitute Sakai's polishing pad with an abrasive fixed to a polishing pad as taught by Chou because both pads are seen as equivalent for the purpose of effecting a method of polishing semiconductor wafers and other substrates, such as memory disk and high dielectric constant films (Chou, [0026]).

#### ***Allowable Subject Matter***

4. Claims 4-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: As to claims 4-13, the prior art of record taken alone or in combination fails to teach a polishing system that comprises a polymer selected from the group consisting of dendritic polymers, comb polymers, bottle-brush polymers, linear dendrimer diblock copolymers, linear-dendrimer triblock copolymers, random-branched polymers, copolymers thereof, and combinations thereof, in combination with the rest of the limitations of the claims.

***Response to Arguments***

6. Applicant's arguments filed 8/30/2006 have been fully considered but they are not persuasive. Applicant traverse the rejection of claims 1-3, 14-20, and 22 under 35 U.S.C. 103(a) over Sakai et al. (EP 1 279708 A1) and claim 21 under 35 U.S.C. § 103(a) over Sakai (EP '708 A1) in view of Chou et al. (US PG-PUB 2002/0125461 A1) as failing to disclose and suggest a polymer having a degree of branching of about 50% or greater. (Remarks, page 3 of 5). Applicants argue Sakai discloses a polyoxyalkylene addition polymer having a total of 4 out of 12 possible branch points, which is less than 50% branching as required by the claims. Applicants also argue Sakai provides no suggest motivation to modify the polymers disclosed by Sakai.

Applicants' arguments are acknowledged and unpersuasive. Although Applicants disclose, "...The degree of branching is equal to the number of branched sites divided by the total number of monomer sites that are capable of branching..." (Specification, [0023]) and "The degree of branching of a highly branched polymer can be determined by NMR spectroscopy" (Specification, [0024]), they have not provided a basis for determining the degree of branching of Sakai's polymer. If branching is determined from NMR activity, then what is Applicants basis for estimating Sakai's polymer having roughly 33% branching? In the absence of NMR data, how does Applicants know the degree of branching in a polymer? Since Sakai illustrates in formula (3) that a polymer having some degree of branching is known, then, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select a polymer having a degree of branching as taught in the Sakai reference, including Applicants'

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specifically claimed degree of branching, for the purpose of suppressing recesses on copper wiring in polishing of a device (Sakai, [0040]).

Applicants argue the basis by which process claims 1-22 and product claim 23 were classified and viewed as being distinct because “the process of using the product as claimed can be practiced with another materially different product, such as a polymer that does not require a degree of branching of 50% or more” makes it clear that the Sakai '708 patent, which discloses a lesser degree of branching, fails to suggest degree of branching of 50% or more. Applicants' arguments are acknowledged. However, the claims 1-23 were not classified on the basis of the Sakai patent, but on the basis of Applicants' claim language and information provided in the Specification.

### ***Conclusion***

**7. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of



the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



**NADINE G. NORTON**  
SUPERVISORY PATENT EXAMINER

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November 3, 2006